

TAXONOMIC STUDY OF *VENEGASIA* (ASTERACEAE: HELENIEAE)

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ABSTRACT

The genus *Venegasia* is treated taxonomically. A single species *V. carpesioides* is recognized. It is largely confined to chaparral type vegetation of southern California and northern Baja California, Mexico. A map showing its distribution is provided. Possible relationships of this well-marked, isolated, genus are discussed and it is concluded that, on morphological grounds, its closest relatives are *Jamesianthus* and *Arnicastrum*, small relictual genera of the southeastern U.S.A. and Mexico, respectively.

KEY WORDS: Asteraceae, *Venegasia*, *Arnicastrum*, *Jamesianthus*, Mexico

Venegasia carpesioides is an attractive suffruticose herb or subshrub 1 – 3 m high. It has large yellow heads with prominent rays and has received the common name Canyon Sunflower (Dale 1986, McAuley 1985) and Jesuit Sunflower (Beauchamp 1986). The species is seemingly confined to the chaparral vegetation of southern California and northern Baja California where it is reportedly common in places, especially following fires.

Venegasia was established as a monotypic genus by De Candolle in 1837 with his description of *V. carpesioides*. It is typified by material collected by David Douglas in southern California; specimens from this collection were sent to De Candolle by the Royal Botanic Gardens, London (KEW).

The generic name commemorates Padre M. Venegas, an early Jesuit scholar and missionary writer of Pueblo, Mexico (Dale 1986). While originally and correctly spelled *Venegasia* by De Candolle, some workers have adopted the spelling *Venegazia* (e.g., Rydberg 1914).

Rydberg (1914) placed *Parthenopsis maritima* in synonymy with *Venegasia carpesioides*, but proposed the new species, *V. deltoidea*, the latter said to be recognized by its deltoid leaves (vs. cordate) and supposedly longer peduncles (mostly ca. 10 mm long vs. ca. 5 mm). Forms with deltoid leaves occur throughout the range of *V. carpesioides*, and peduncle length likewise varies (mostly from 1 – 6 cm). Recent floristic workers have consistently recognized but a single species (e.g., Munz 1974; Wiggins 1980), as do we. Indeed, since its description, to our knowledge, no one has recognized *V. deltoidea* as distinct.

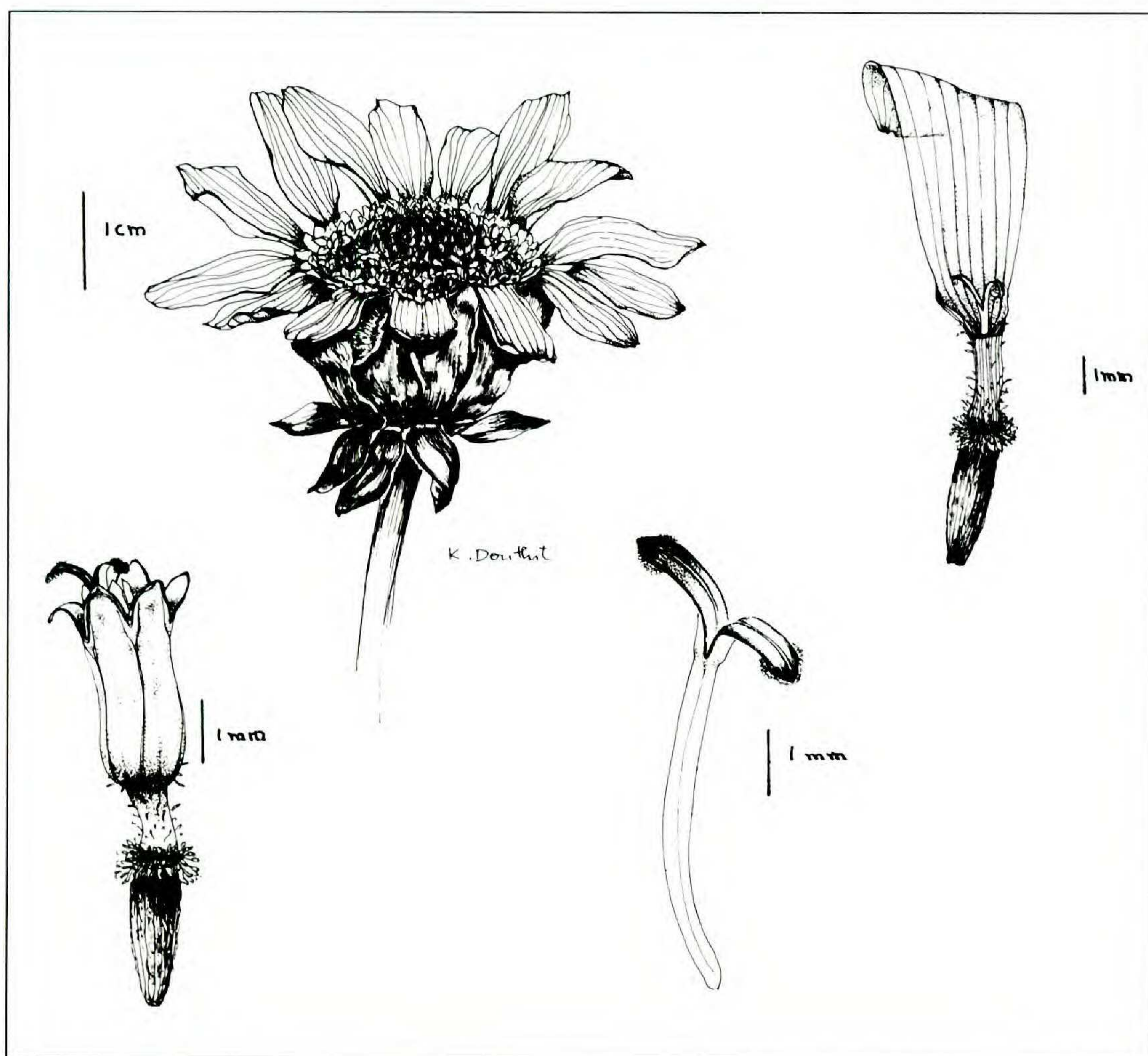


FIG. 1. Head and floral parts of *Venegasia carpesioides* (Raven 15438, TEX): upper left, head; upper right, ray floret; lower left, disk floret; lower right, style.

VENEGASIA DC., Prod. 6:43. 1837.

Parthenopsis Kellogg, Proc. Calif. Acad. 5: 100. 1873. Based on *Parthenopsis maritima* Kellogg

Suffruticose perennial herbs or shrublets 1 – 3 m high. Leaves mostly opposite, deltoid-ovate to cordate, markedly petiolate, glabrous or nearly so, the margins coarsely dentate to subentire. Heads hemispheric, mostly single and axillary, the peduncles 1 – 10 cm long. Involucres 3 – 4 seriate, the bracts subequal, the outer series mostly loose and subscarious, the middle series with broadly rounded apices. Receptacle convex, epaleate, minutely pubescent. Ray florets 13 – 34, pistillate, fertile, the ligules conspicuous, yellow. Disk florets numerous, yellow, the tube/limb ratio ca. 1/4, the tube densely glandular pubescent, 5-lobed. Anther appendages glandular. Appendages of style branches broadly obtuse in outline. Achenes clavate, black, striate, epappose. Base chromosome number, $x = 19$.

Type species, *Venegasia carpesioides* DC.

***Venegasia carpesioides* DC.**, Prod. 6: 43. 1837. TYPE: CALIFORNIA: w/o specific locality, 1833, *D. Douglas* 54 (HOLOTYPE: P; ISOTYPE: NY!). The date and collection number are as given on the isotype.

Parthenopsis maritimus Kellogg, Proc. Calif. Acad. Sci. 5: 101. 1873. TYPE: CALIFORNIA: Santa Rosa Island, 1872-73, *W.G.W. Harford* (HOLOTYPE: CAS).

Venegasia deltoidea Rydb., N. Amer. Fl. 34, pt. 1: 5. 1914. TYPE: MEXICO. BAJA CALIF. NORTE: "Sauzal", 7 Apr 1886, *C.R. Orcutt s.n.* (HOLOTYPE: NY!). As originally described, Rydberg gave the locality as "Sangal" but the locality on the type specimen appears to read as we give it here. El Sauzal is a fishing village located about 5 mi north of Ensenada, Mexico.

A single species, as described for the genus (cf. illustration, Figure 1 here and Figure 5319, Abrams & Ferris 1960).

Distribution and Ecology (Fig. 2): Coastal ranges of California from southern Monterey County to San Diego County and Channel Islands (Santa Rosa and Santa Cruz), southwards into Mexico along the coastal ranges to about latitude 31° N, occurring in coastal chaparral from near sea level to ca. 1000 m, reportedly common following burns. Flowering mainly from Apr-Jun.

GENERIC RELATIONSHIPS

When originally proposed, *Venegasia* was positioned in the tribe Senecionieae. Bentham (1873), largely because of its epaleate receptacles, placed the genus in the tribe Helenieae, subtribe Jaumeinae, where it was retained by Hoffmann (1894).

Turner and Powell (1976), in their sweeping conspectus of the tribe Helenieae, treated *Venegasia* rather indifferently, merely noting that it appeared to belong, along with *Jaumea*, in the subtribe Jaumeinae (which they positioned in their newly erected tribe Coreopsidae). They also noted that *Venegasia* and *Jaumea* seemed to have a number of morphological features which serve to relate the two genera to both the Coreopsidae and Senecioneae (e.g. *Arnica* and *Whitneya*). Stuessy (1976) accepted both *Jaumea* and *Venegasia* as the only members of his "group 7" of the subtribe Coreopsidinae of the Heliantheae.

Robinson (1981), in his account of the tribe Heliantheae (including Helenieae), in which 35 subtribes were recognized, daringly positioned *Venegasia* in the subtribe Chaenactidinae, which also included *Arnica* and *Whitneya* and numerous other rather anomalous genera (e.g. *Palafoxia*), but positioned *Jaumea* as a monotypic element of the subtribe Jaumeinae. Nevertheless, he singled out *Venegasia* as "singularly distinctive" among the subtribe Chaenactidinae in having stalked glands on its anthers.

Venegasia has a base chromosome number of $x = 19$ (Raven & Kyhos 1961; Keil & Pinkava 1976). Other isolated, seemingly relictual, genera of the Heliantheae such as *Jaumea*, *Montanoa*, and *Podachaenium*, share this meiotic count but these do not appear to relate closely to *Venegasia*. In contrast, within Robinson's concept of the Chaenactidinae there are several genera with base numbers of $x = 19$,

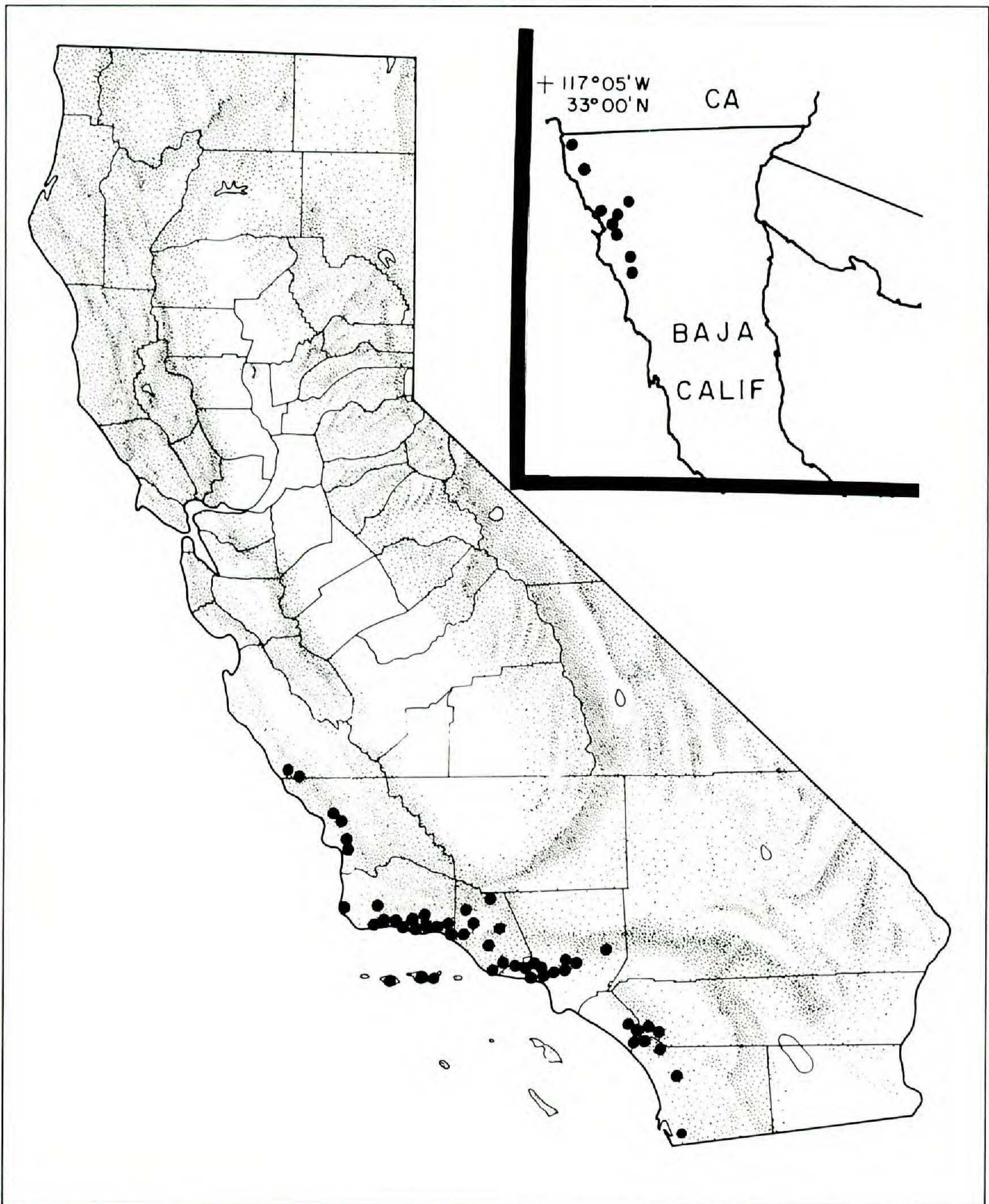


FIG. 2. Distribution of *Venegasia carpesioides* in U.S.A. (California) and Mexico (inset).

including *Arnica*, *Hulsea* and *Whitneya*, none of which, in our opinion, appears especially close to *Venegasia* on morphological grounds.

Limited phytochemical examinations of *Venegasia* by Crawford and Stuessy (1981) have shown that it does not possess anthochlors (chalcones and aurones), which would tend to exclude it from the tribe Coreopsidae, members of which tend to exhibit such compounds. Nonetheless, these authors retained *Venegasia* in that tribe, feeling that their absence in the latter was a loss phenomenon. Geissman and Atala (1971) noted the occurrence of the sesquiterpene lactone

TABLE 1. Comparison of genera whose relationships are thought to be closest to *Venegasia*.

<i>Venegasia</i>	<i>Arnicastrum</i>	<i>Jamesianthus</i>
Habit		
perennial herbs	perennial herb	perennial herb
stems suffruticose	herbaceous	herbaceous
Leaves		
alternate above	opposite	opposite
strongly petiolate	sessile	sessile or subsessile
Capitulescence (heads)		
mostly single	single	3 or more
axillary	terminal	terminal
Involucres		
bracts in 2 – 3 distinct series	ditto	ditto
subequal and subscarious	ditto	ditto
outer series loose and enlarged	ditto	ditto
Receptacles		
convex epalate	ditto	ditto
Ray Florets		
pistillate, fertile rays yellow	ditto	ditto
Disk Florets		
tube/limb ratio		
1/4	1/3 – 1/2	1/3
tube densely	sparsely	moderately
glandular pubescent	glandular pubescent	glandular pubescent
Anthers		
appendages		
glandular	glandular	glandular
Styles		
branches (apices)		
broadly conical	ditto	ditto
shaft nodular	ditto	ditto
at base		
Achenes		
ray florets		
epappose	pappose	epappose
disk florets		
epappose	10 bristles	∞bristles
black, striate	ditto	ditto
Chromosome No.		
x = 19	x = ?	x = 16

“eupatoriopicrin” in *Venegasia*, a compound previously reported only from the genera *Eriophyllum*, *Eupatorium* and *Chaenactis*. While the *Eupatorium* connection seems far-fetched, the *Eriophyllum* and *Chaenactis* connections are suggestive.

In summary, *Venegasia* does not appear to relate very closely to any known genera. After examining a large group of taxa, especially among the Helenieae, a tribe which the senior author now accepts as largely natural (Kim and Turner, in prep.), the genera he currently favors as closest to *Venegasia* on morphological grounds are *Arnicastrum* and *Jamesianthus*, both rare, presumably relictual genera which Robinson (1987) positioned in his subtribe Chaenactidinae. These several

taxa have a number of characters in common, as indicated in table 1. Whether these are properly positioned within Robinson's subtribe Chaenactidinae or better placed elsewhere must await more definitive studies, presumably using DNA data.

Representative Specimens: MEXICO. Baja Calif. Del Norte: 6 mi S of San Vicente, 11 Apr 1936, *Epling s.n.* (NY); 1 mi E of La Misión, 250 m, 30 Mar 1975, *Moran 21715* (ARIZ, POM, RSA, TEX, UC); canyon just E of Buena Vista, 230 m, 2 Jun 1979, *Moran 27542* (RSA); 5 km SE of Erendira, ca. 50 m, 7 Mar 1982, *Moran 29996* (ARIZ); 9 mi S of Maneadero, ca. 200 m, 21 Jun 1985, *Thorne 61047* (RSA); Rancho Loma Linda, Las Animas: N-facing slopes, ca. 200 m, 15 Mar 1987, *Thorne 62290* (RSA).

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